

to 633 ft. through tuff; from 633 ft. to 674 ft. through andesite; from 674 ft. to 731 ft. through silicified tuff; from 731 ft. to 737 ft. through dark tuff; from 737 ft. to 742 ft. through silicified tuff; and from 742 ft. to 756 ft. through andesite.

One of the subsidiary objects in drilling these bores, especially No. 1, was to ascertain the nature of the rocks below No. 11 level. Although this information to a depth of 500 ft. below No. 11 level is given by No. 1 bore, and to a somewhat greater depth by No. 2 bore, it could have been ascertained with a fair degree of accuracy by a geological study, based principally on the section exposed in the lower part of the Waihi Mine.

Many of the mining men at Waihi have a firm conviction that the so-called "bedded country" (tuffs, &c.) does not and will not carry payable lodes. The same view is expressed in Geological Survey Bulletin No. 15, but is combated in Bulletin No. 26. This belief is poorly founded, and at least four-fifths of its foundation is mere prejudice. One fact, easily apprehended, shows this. The richest part of the Talisman Mine, Karangahake, from No. 13 level downward, was in similar rocks. The reasons for the poverty of certain parts of the Waihi lodes, especially in depth, are to be sought mainly in other conditions than those that distinguish an andesitic tuff from an andesite. The more pronounced faulting and crushing of the bedded tuffaceous rocks is, however, an adverse factor to be considered.

I am not able to give a definite statement of the thickness of the horizon at Waihi in which bedded tuffs are prominent: it appears to be 600 ft. or 700 ft. at least. The similar horizon of alternating layers of tuff and andesite at Karangahake, which possibly is to be correlated with the Waihi occurrence, is more than 800 ft. thick. The Woodstock bore, drilled about 1903, is stated to have entered "slate" at 950 ft., but this is doubtful. A bore (No. 4) drilled in 1920 by the Talisman Company to a depth of 501 ft. from its lowest level reached a level corresponding to about 1,000 ft. in the Woodstock bore, and was there in andesite.

Future Prospecting in the Waihi Grand Junction Mine.

East Section: The most practical prospecting scheme for the Waihi Grand Junction Mine under the conditions prevailing at the end of 1924 would be one directed towards the exploration of the eastern part of the mine. This could best be done at No. 8 (1,320 ft.) level by driving east along the course of the Empire lode and crosscutting north and south. There is a large extent of unexplored ground, and prospecting need be limited only by the funds available and the difficulty of providing adequate ventilation. Exploration at No. 8 level will probably decide the value of the eastern part of the Grand Junction Mine once for all. There is little or no chance of ore above the 1,000 ft. horizon. Any ore-body with its cap much deeper than No. 8 level will not pay to work unless it is very rich.

West Section: A proposal to bore vertically in that part of the Grand Junction property west of Martha Hill has been made, but the results of such boring are not likely to be commensurate with the cost. Slightly more advisable is the further sinking of the C shaft (sunk many years ago to a depth of 516 ft.) to 1,000 ft. or more, followed by lateral exploration, but the expense of this, in comparison with the somewhat moderate chance of success, may be regarded as prohibitive. The most feasible method of testing the west section is to drive at a low level from the western part of the Waihi Mine, or to project horizontal bores from the same locality into the Grand Junction ground.

Conclusion: So far as the prospects of the Grand Junction and neighbouring mines are concerned, very little can be added to what has been said in Geological Survey Bulletin No. 26. Vertical or highly inclined bores as a mode of prospecting at Waihi must be condemned, both on general principles and on past experience, but there is some scope for horizontal drilling.

6. **MUIR'S GOLD-REEFS (LIMITED), TE PUKE.**

(Summary of reports by P. G. MORGAN.)

On the 20th January, and again on the 26th May, 1925, I examined the Muir's Gold-reefs Mine and the surrounding country. Previous visits were made in November, 1921, and December, 1922.

Since the end of 1922 the adit levels of Muir's Gold-reefs have been extended, and a considerable amount of ore extracted and treated in the twenty-stamp battery. Owing to the nearly complete exhaustion of the payable veinstone the battery was closed down during 1924. Up to that time the Muir lode, with the assistance of a very small amount of ore from the Massey lode, had yielded 66,763 tons of ore, from which gold and silver to the value of £164,777 had been obtained. Several winzes sunk below No. 3 adit level showed that the Muir lode, though maintaining its size, was not payable. An assay of about £2 per ton was obtained in a short prospecting-drift off No. 3 winze at a depth of 145 ft., but water prevented the further sinking of the winze at this time.

The company then concentrated its energies on deepening a shaft already under way, with a view of driving crosscuts to both the Muir lode and the Fleming or Massey lode, situated 800 ft. to the west. During 1924 the shaft was sunk to a depth of 515 ft., and a chamber opened at 500 ft., which is approximately 450 ft. below the lowest adit level, and 300 ft. below the point at which water was encountered in No. 3 winze. From the chamber two crosscuts have been driven—one to the south-east to intersect the Muir lode at a point below the best part of the ore-shoot in the upper levels, and the other south-south-west to intersect the Massey lode.

Muir Lode Crosscut.—In May last the crosscut to the Muir lode had been driven for 756 ft. A short distance from the shaft it passed through a fault or "slide," dipping, at a rough guess, 20°–25° eastward. At 562 ft. another flatly-dipping slide was met: this had a westerly dip of roughly 15°. At 590 ft. the crosscut passed out of the slide. At 617 ft. lode quartz was intersected, and the crosscut was turned eastward nearly at right angles to the course of the lode. Quartz with bands of country (andesitic rock) continued almost to the end of the crosscut. Close to the face, in the roof, some hard clayey material of light colour ("pug," or fault-comminuted rock) appeared. Holes bored in the lower part of the face had reached puggy material. Without much doubt a considerable fault is ahead, and this view is confirmed by the surface topography.